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# Review of the Euchroeine Chrysidids (Hymenoptera: Chrysididae)

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The Euchroeini contains some of the more highly modified and unusual-looking genera in the Chrysididae. The taxonomy of this group has long been confused and as many as 20 different generic names have been used. Included in the Euchroeini are the largest chrysidids, members of the genus *Stilbum*, reaching up to 25 mm in length. Although Euchroeini is primarily an Old World group, 2 species of *Spinolia* are found in the New World, and *Neochrysis* is strictly neotropical.

I am following the higher classification proposed by Bohart and Kimsey (1980) and Kimsey and Bohart (1981). Members of the Euchroeini are distinguished by their characteristic wing venation: the forewing radial sector extends over half the length of the marginal cell and bends slightly away from the coastal margin. Based on this characteristic 5 genera are included: *Euchroeus, Stilbichrysis, Spinolia, Stilbum* and *Neochrysis*.

This study is intended as a preliminary reorganization of the generic taxonomy of these chrysidids in preparation for a more detailed cladistic analysis of the chrysidid genera.

Under each genus I give a preliminary list of included species. These lists are based on Linsenmaier (1959, 1968), Mocsáry (1889), original descriptions and examination of types, as indicated by an asterisk. Some names in the lists may prove to be synonyms as I have not seen all of the types. Host and distributional data are summarized in Table 1 and Fig. 1, respectively. Male genitalia are not particularly useful in this group at the generic level, except to distinguish *Neochrysis*.

The following abbreviations are used: RS = radial sector, 1A = anal vein, Cu = cubital vein, T = gastral tergum, S = gastral sternum, and MOD = midocellus diameter.

This paper is dedicated to Richard M. Bohart who has done more to straighten out the taxonomy of the Chrysididae than any other systematist living or dead.

## KEY TO GENERA OF EUCHROEINI

1. Metanotum produced posteriorly into large spoon-like projection (Fig. 5); least frontal width less than eye width in front view (Fig. 2); T-III with 4 symmetrical apical teeth ..... *Stilbum* Spinola
– Metanotum not produced into spoon-like projection, least frontal width usually greater than eye width, T-III variable ..... 2
2. Hindwing with 3 sclerotized veins and M+Cu forked; scutellum elevated above level of scutum and metanotum; metanotal surface irregular and denticulate ..... *Stilbichrysis* Bischoff
– Hindwing with 2 or fewer sclerotized veins and M+Cu, not forked or

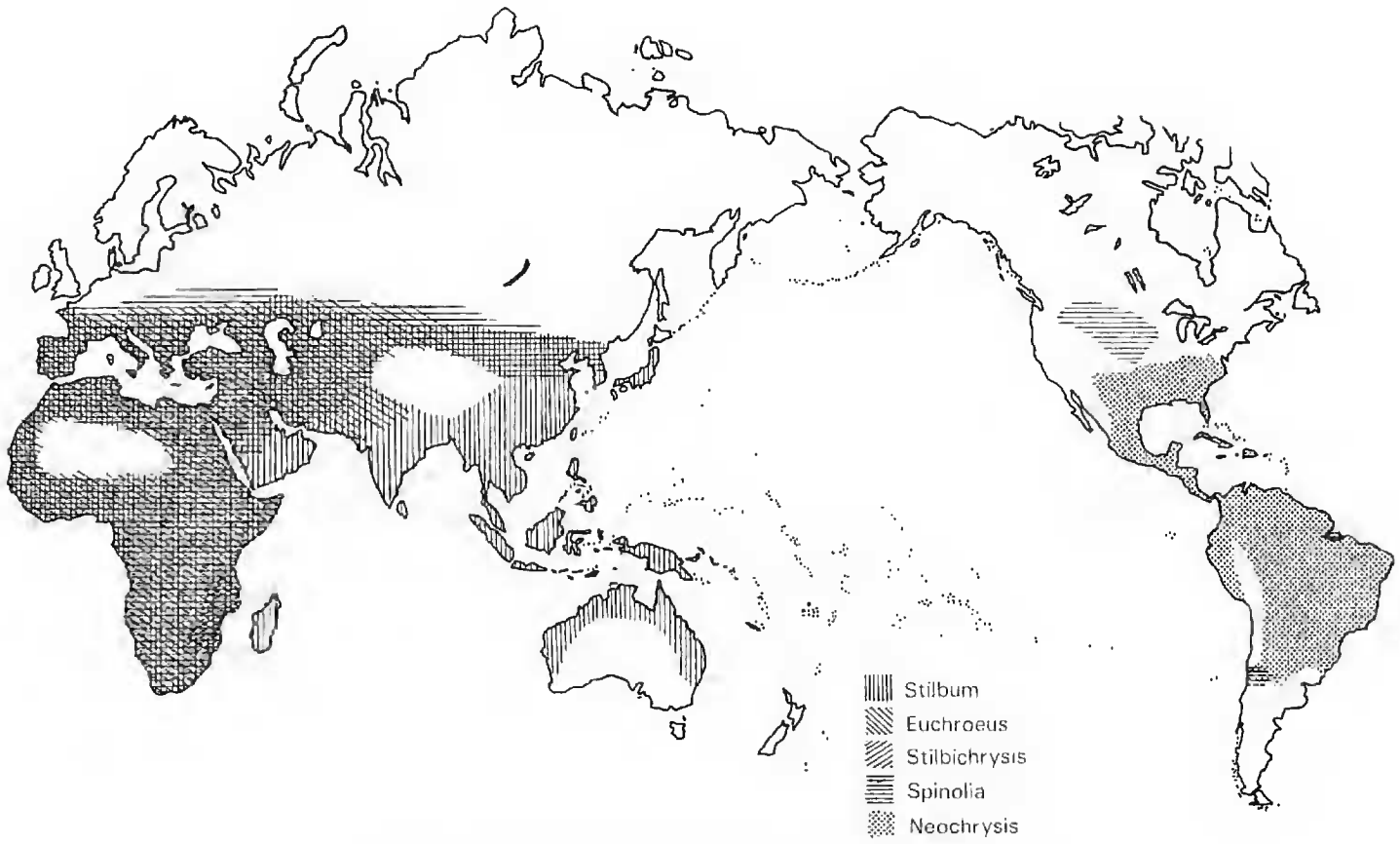



Fig. 1. Distribution map of euchroeine genera.

absent; scutellum not elevated above level of scutum and metanotum; metanotal surface relatively even and smooth ..... 3

3. Mesopleuron with 2 large teeth pointing ventrally, similar to Fig. 6; T-III dentate, with 8 or more asymmetrical teeth or more rarely 4 white teeth ..... *Euchroeus* Latreille

– Mesopleuron without 2 large teeth pointing ventrally; T-III with 2, 4 or 6 symmetrical, non-white teeth (as in Fig. 8) or edentate ..... 4

4. T-III with 4 or 6 apical teeth ..... *Neochrysis* Linsenmaier

– T-III apical rim edentate, with small irregularities or with 2 small lateral teeth ..... *Spinolia* Dahlbom

### *Euchroeus* Latreille

*Chrysis* Linnaeus, in part.

*Euchroeus* Latreille, 1809:578. Type species: *Chrysis purpurata* Fabricius, 1787.

*Brugmoia* Radoszkowski, 1877:26. Type species: *Brugmoia pellucida* Radoszkowski, 1877, orig. desig.

*Brugmoja* Radoszkowski, 1877:pl. 2, fig. 12. Misspelling of *Brugmoia.*

*Polyodontus* Radoszkowski, 1877:25. Type species: *Polyodontus stchurovsky* Radoszkowski, 1877, orig. desig.

*Euchroeides* Nurse, 1904:23. Type species: *Euchroeides oblatus* Nurse, 1904, by monotypy.

*Afrospinolia* Linsenmaier, 1968:42. Type species: *Euchroeus katanganus* Linsenmaier, 1968, orig. desig. (treated as subgenus of *Euchroeus*). **New synonymy.**

*Diagnosis.*—Malar space 1.0 MOD long or usually longer; face with transverse frontal carina (Fig. 3); tongue as long as eye height or longer; mesopleuron with transverse medial groove and 2 or more sharp teeth pointing ventrally; metanotum evenly rounded; T-I anterior corners rounded; T-III apically with more than 8

Table 1. Hosts of euchroeine species.

| Euchroeine species | Host species | Family | Author |
|---|---|---|---|
| *Stilbum cyanurum* | *Sceliphron destillatorium* Illig. | Sphecidae | Grandi, 1961 |
| | *Eumenes unguiculatus* Villers | Eumenidae | |
| | *Sceliphron* sp. | Sphecidae | Zimmermann, 1937 |
| | *Eumenes* sp. | Eumenidae | |
| | *Odynerus* sp. | | |
| | *Rhynchium* sp. | | |
| | *Chalcidoma* sp. | Megachilidae | |
| | *Megachile* sp. | | |
| *S. viride* | *Eumenes maxillosus* DeGeer | Eumenidae | |
| *Spinolia neglectus* | *Odynerus spinipes* (Linnaeus) | | Linsenmaier, 1959 |
| | *Odynerus reniformis* (Gmelin) | | |
| *S. humboldti* | *Paravespa grandis* Morice | | |
| *S. dallatorreanus* | *Pterocheilus bembeciformis* | | |
| *S. lamprosomus* | *Odynerus spiricornis* (Spinola) | | |
| *Neochrysis* sp. | *Podium* sp. | Sphecidae | Summarized in Bohart and Kimsey, 1980 |
| | *Trypoxylon* sp. | | |
| | *Sceliphron* sp. | | |

irregular teeth or denticles (Fig. 9) (except *singularis*), and apical rim and teeth often at least partly white or transparent; female T-V and S-V unmodified (as in Figs. 11, 12).

*Distribution* (*Fig. 1*).—Europe and the Middle East, south to South Africa.

*Included species.*—*artifrons* Edney 1947*, *aurovirens* (Mocsáry) 1913 (*Chrysis*), *binodatus* Edney 1947*, *candens* Dahlbom 1845, *chrysidiformis* Magretti 1898, *doursi* Gribodo 1875, *egregius* Buysson 1887, *eos* (Semenov) 1954 (*Chrysis*), *hellenicus* (Mocsáry) 1913 (*Chrysis*)*, *jordanicus* Linsenmaier 1968, *katanganus* Linsenmaier 1968, *limbatus* Dahlbom 1854*, *mongolicus* Tsuneki 1947, *moricei* Buysson 1896*, *oblatus* (Nurse) 1904 (*Euchroeides*)*, *oculatissimus* Buysson 1898, *pellucidus* (Radozskowski) 1877 (*Brugmoia*), *purpuratus* (Fabricius) 1787 (*Chrysis*)*, *rugulosus* (Mocsáry) 1909 (*Chrysis*)*, *singularis* (Spinola) 1838 (*Chrysis*)*, *stchurovsky* (Radozskowski) 1877 (*Polyodontus*).

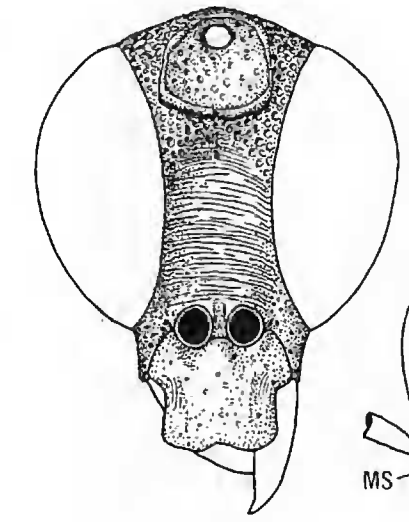
*Discussion.*—Members of *Euchroeus* can be readily distinguished from other chrysidids by the dentate mesopleuron and numerous irregular teeth along the apical rim of T-III. One exception to this is the species *singularis,* which has roughly 4 symmetrically arranged white teeth. Other characteristics of this species including the mesopleural teeth, long malar space and unmodified female T-V and S-V, definitely place *singularis* in *Euchroeus.* Another distinctive feature that occurs in several species, including *singularis* and *candens,* is the white coloration on the apical rim of T-III. This characteristic also occurs in *Neochrysis* (*Ipsiura*), *Argochrysis* and *Spintharosoma,* the latter 2 belonging in the Chrysidini.

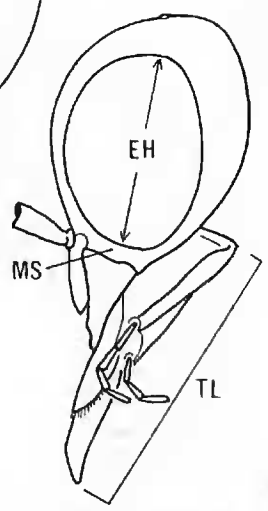
*Euchroeus* species are rarely encountered; *purpuratus,* a European wasp, is probably the most commonly collected.

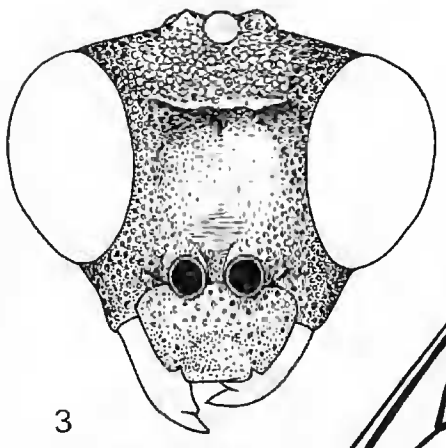
### *Neochrysis* Linsenmaier

*Chrysis* Linnaeus, in part.

*Neochrysis* Linsenmaier 1959:74. Type species: *Chrysis punctatissima* Spinola,

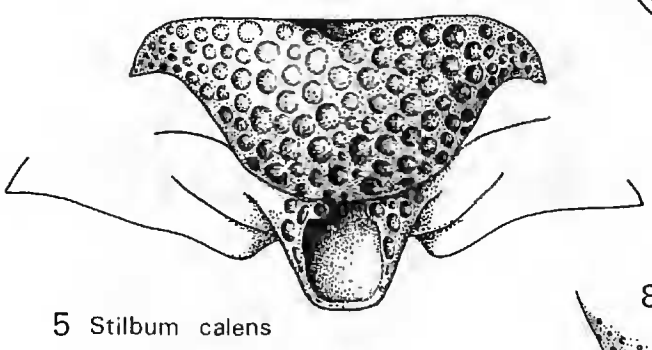


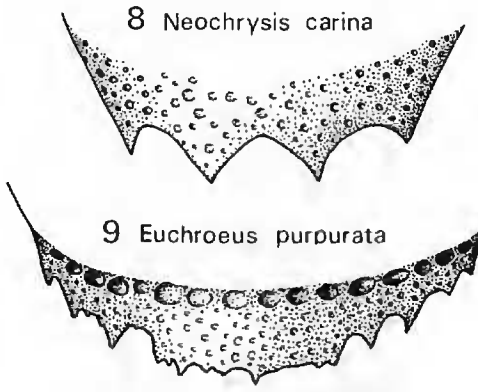



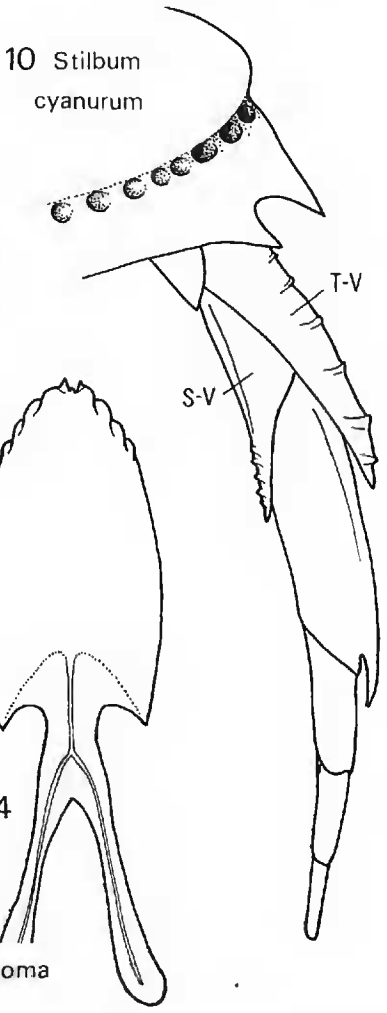



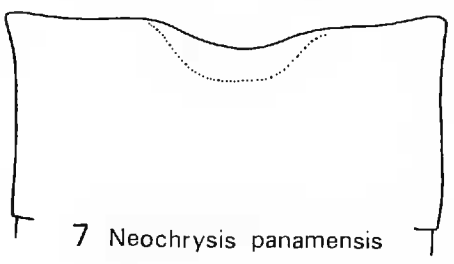


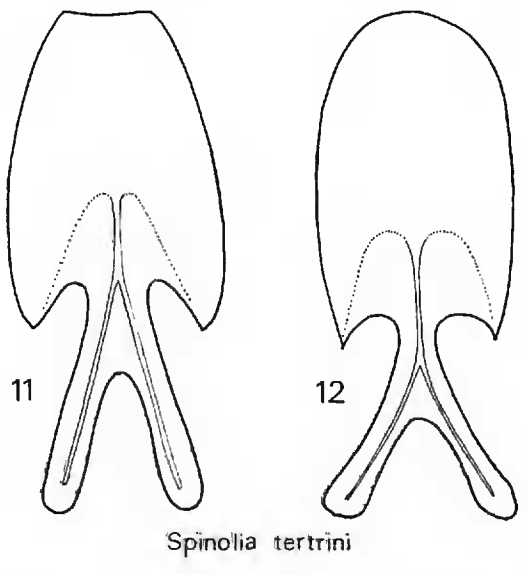


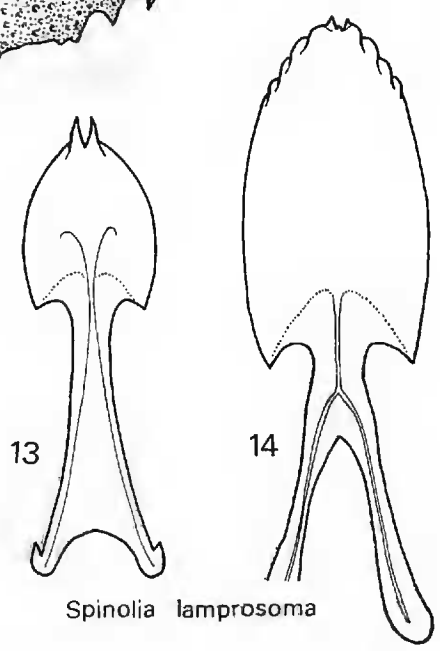



Figs. 2–14. 2, 3, Male face, front view. 4, Female head, lateral view: eye height (EH), malar space (MS), tongue length (TL). 5, Scutellum, metanotum and propodeum, dorsal view. 6, Male body, lateral view: radial sector (RS), cubital vein (Cu), mesopleural teeth (MT). 7, Tergum I, dorsal view. 8, 9, Male tergum III, apical rim. 10, Ovipositor, lateral view. 11–14, Ovipositor segments. 11, 13, Tergum V, dorsal view. 12, 14, Sternum V, ventral view.

1840, orig. desig., nec Villers 1789 = *carina* Brullé, 1846 (treated as subg. of *Chrysis*).
*Neochrysis* Linsenmaier, Bohart 1966 (elevated to genus).
*Pleurocera* Guérin 1842: 149. Preocc. by *Pleurocera* Rafinesque, 1818. Type species: *Pleurocera viridis* Guérin, 1842 (nec Oliver, 1790) = *Chrysis bruchi* Brèthes, 1902, by monotypy.
*Pleurochrysis* Bohart 1966:144, n.n. for *Pleurocera* Guérin (treated as subg. of *Neochrysis* by Bohart and herein).
*Exochrysis* Bohart 1966:141. Type species: *Chrysis panamensis* Cameron, 1888, orig. desig. (treated as subg. of *Neochrysis* by Bohart and herein).
*Ipsiura* Linsenmaier 1959:74. Type species: *Chrysis marginalis* Brullé, 1846, orig. desig. (treated as subg. of *Neochrysis* by Bohart and herein).

*Diagnosis.*—Malar space 1.5 MOD long or less, tongue length usually shorter than eye height, mesopleuron without medial groove, T-I anterior corners sharply angled (Fig. 7), T-III with 4 or 6 symmetrical apical teeth (Fig. 8), female T-V and S-V unmodified or T-V with small ridge-like annulations, male paramere divided into a distinct, articulated telomere and basomere.

*Distribution* (*Fig. 1*).—Western Hemisphere, the southern half of the United States south to Chile and Argentina.

*Discussion.*—See Bohart and Kimsey (1980) and Kimsey and Bohart (1981) for discussion of generic and subgeneric taxonomy and included species. The male genitalia of *Neochrysis* is unique in the Euchroeini due to the articulated telomere.

### ***Spinolia*** **Dahlbom**

*Chrysis* Linnaeus, in part.
*Euchroeus* Latreille, in part.
*Holochrysis* of Mocsáry, in part.
*Pseudochrysis* of Balthasar and Trautmann, in part.
*Spinolia* Dahlbom 1854:363. Type species: *Chrysis magnifica* Dahlbom, 1854, orig. desig. (= *lamprosoma* Förster, 1853).
*Gonochrysis* Lichtenstein 1876:227. Type species: *Chrysis albipennis* Dahlbom, 1854 (= *unicolor* Dahlbom, 1831).
*Achrysis* Semenov 1892:486. Type species: *Chrysis unicolor* Dahlbom, 1831 (treated as subg. of *Pseudochrysis*).
*Spinolaia* Schulz 1906:154, emendation of *Spinolia*.
*Pseudospinolia* Linsenmaier 1951:31. Type species: *Chrysis uniformis* Dahlbom, 1854, orig. desig. (treated as subg. of *Euchroeus*). **New synonymy.**
*Neospinolia* Linsenmaier 1968:39. Type species: *Chrysis tertrini* Buysson, 1897, orig. desig. (treated as subg. of *Euchroeus*). **New synonymy.**
*Pseudospinolia* Linsenmaier, Bohart and Kimsey, 1980, elevated to genus.

*Diagnosis.*—Malar space 1.0 MOD long or shorter (Fig. 4); tongue as long as eye height or longer (Fig. 4) (except *tertrini*); mesopleuron with transverse medial groove and without teeth or knobs; metanotum evenly rounded; T-I anterior corners rounded; T-III apical rim smooth or with slight irregularities and rounded, some species with 2 small lateral teeth.

*Distribution* (*Fig. 1*).—Palearctic, Africa, 1 species reaching North America (*neglectus*) and 1 in Chile (*tertrini*).

*Included species.*—*ardens* (Mocsáry) 1902 (*Chrysis*)*, *aureicollis* (Abeille) 1878 (*Chrysis*)*, *bouvieri* (Buysson) 1897 (*Chrysis*)*, *chalcites* (Mocsáry) 1890 (*Chrysis*)*, *chobauti* (Buysson) 1891 (*Chrysis*)*, *dallatorreanus* (Mocsáry) 1896 (*Chrysis*)*, *dournovi* (Radozskowski) 1866 (*Chrysis*)*, *gestroi* (Gribodo) 1874 (*Chrysis*), *gratiosus* (Mocsáry) 1889 (*Chrysis*), *herodianus* Morice 1909, *humboldti* (Dahlbom) 1845 (*Chrysura*)*, *ignithorax* (Balthasar) 1853 (*Pseudochrysis*), *incrassatus* (Spinola) 1838 (*Chrysis*), *insignis* (Lucas) 1849 (*Chrysis*), *lamprosomus* (Förster) 1853 (*Chrysis*)*, *marqueti* (Buysson) 1887 (*Chrysis*)*, *morawitzi* (Mocsáry) 1889 (*Chrysis*)*, *neglectoides* Linsenmaier 1959 **NEW COMB.**, *neglectus* (Shuckard) 1837 (*Chrysis*)*, *pulawskii* Linsenmaier 1968, *rogenhoferi* (Mocsáry) 1889 (*Chrysis*)*, *rugosa* Buysson 1900, *tertrini* (Buysson) 1897 (*Chrysis*)*, *theresiae* (Buysson) 1900 (*Chrysis*)* **NEW COMB.**, *transversus* (Dahlbom) 1854 (*Chrysis*), *tricoloricornis* Linsenmaier 1968 **NEW COMB.**, *unicolor* (Dahlbom) 1831 (*Chrysis*)*, *uniformis* (Dahlbom) 1854 (*Chrysis*)*, *vogti* (Trautmann) 1926 (*Pseudochrysis*).

*Discussion.*—Linsenmaier (1959, 1968) placed the euchroeine species without apical teeth on T-III in 6 subgenera, *Spinolia, Pseudospinolia, Stilbichrysis, Primachroeus, Neochrysis, Prospinolia* and *Neospinolia,* which he included in *Euchroeus. Primachroeus* actually belongs in the Chrysidini, based on the position of the RS vein. The remaining subgenera were distinguished by the structure of the mesopleuron, length of the malar space, presence or absence of a transverse frontal carina on the face and the structure of T-II and T-III. In the case of *Neochrysis* and *Stilbichrysis* this approach is too conservative as these groups differ sufficiently to require generic status. After examining additional species from Africa it has become apparent that there are no clear-cut differences between the remaining subgenera. The elevation of *Pseudospinolia* to generic status by Bohart and Kimsey (1980) was premature. Characteristics such as the mesopleural sculpture, transverse frontal carina, pronotal carina and modification of the female ovipositor segments (T-V and S-V) vary too inconsistently between species to distinguish subgenera (see Table 2). As a result, I am synonymizing these names under *Spinolia* Dahlbom, which has priority.

### *Stilbichrysis* Bischoff

*Stilbichrysis* Bischoff 1910:445. Type species: *Stilbichrysis biselevata* Bischoff, 1910, orig. desig.

*Diagnosis.*—Body, lateral view (Fig. 6), face with frontal carina, tongue longer than eye height, malar space about 1.0 MOD long, mesopleuron with 2 teeth and strong medial groove, hindwing with well developed RS, M+Cu and 1A veins, scutellum elevated, metanotum elevated with medial tooth, T-I anterior corners rounded, T-III apical rim smooth and rounded; female T-V and S-V apically with large ridge-like annulations (as in Fig. 10).

*Distribution* (*Fig. 1*).—Africa: Zimbabwe, Mozambique, South Africa and Tanzania.

*Included species.*—*biselevata* Bischoff 1910*, *serrulata* (Edney) 1947 (*Chrysis*)* **NEW COMB.**

*Discussion.*—Both of these species are rarely collected; they superficially resemble *Stilbum* but can be distinguished from it and other euchroeine genera by: T-III rim edentate, metanotum denticulate, malar space short, mesopleuron dentate and grooved and hindwing with sclerotized M+Cu and 1A veins.

Table 2. Morphological characteristics of selected species of *Spinolia* representing 3 subgenera according to Linsenmaier (1959, 1968).

| Characteristics | Species: Subgenus *Spinolia* s.s. | | | | | Subgenus *Pseudospinolia* | | | | | | | Subgenus *Neospinolia* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *dallatorreanus* | *dournovi* | *lamprosoma* | *rugosus* | *unicolor* | *aureicollis* | *bouvieri* | *chobauti* | *humboldti* | *incrassatus* | *neglectus* | *uniformis* | *tertrini* |
| Face with transverse frontal carina | − | − | − | − | − | − | + | + | + | + | − | − | + |
| Pronotum with lateral carina | − | − | − | − | − | − | − | − | + | + | − | − | − |
| Malar space longer than 1 MOD | − | − | − | − | − | − | − | + | − | − | − | − | + |
| Mesopleuron with medial groove | + | + | + | + | + | − | + | + | − | + | − | − | + |
| Mesopleuron with U-shaped carina | + | + | + | + | + | + | − | − | + | + | + | − | + |
| Female T-V and S-V annulate (Fig. 10) | + | − | − | ? | − | − | + | ? | + | + | − | − | − |
| Female T-V and S-V dentate (Figs. 13, 14) | − | − | + | ? | + | − | − | ? | − | − | − | − | − |
| Female T-V and S-V unmodified (Figs. 11, 12) | − | − | − | ? | − | − | − | ? | − | − | + | − | + |
| Tongue shorter than eye height | − | − | − | − | ? | − | − | − | − | − | − | − | + |

## *Stilbum* Spinola

*Chrysis,* Linnaeus, in part.
*Stilbum* Spinola 1806:9. Type species: *Chrysis calens* Fabricius, 1781, orig. desig.

*Diagnosis.*—Face with frontal carina, malar space 2.0 MOD or more long (Fig. 2), tongue about as long as eye height, mesopleuron with strong medial groove and 3 or more teeth or knobs, scutellum elevated, metanotum enlarged into a backward projecting spoon-like structure (Fig. 5), T-I anterior corners rounded, T-III with 4 apical teeth, female T-V and S-V apically pointed with large ridge-like annulations (Fig. 10).

*Distribution* (*Fig. 1*).—Southern Europe, Africa, Madagascar, India to the Australasian Region.

*Included species* (*after Linsenmaier, 1959*).—*calens* (Fabricius) 1781 (*Chrysis*), *chrysocephalum* Buysson 1897, *cyanurum* Förster 1771, *pici* Buysson 1891, *viride* Guérin 1842.

*Discussion.*—*Stilbum* includes the largest chrysidids and certainly the most commonly encountered species in Africa, parts of Asia and Australia. The exact number of species in this genus is controversial; unlike Linsenmaier (1959), Zimmermann (1937) considered *Stilbum* to contain only 2 species, *cyanurum* and *viride,* and he synonymized the remainder under *cyanurum.* The question of the number of species in *Stilbum* needs further study. Members of this genus can be distinguished by the unusually long narrow face (Fig. 2), mesopleural sculpture, metanotal projection and T-III with 4 teeth apically. *Stilbum* commonly parasitizes wasps that build mud nests on a variety of surfaces including man-made structures, which may account for the commonness and wide distribution of this genus.

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